

WHAT IS CLAIMED IS:

1. A nail varnish composition comprising, in a cosmetically acceptable medium, at least one film-forming polymer, wherein the nail varnish composition is capable of forming a film having an adherence, measured according to the ASTM D 3359-7 standard, corresponding to a percentage of detachment of less than 35%.

2. The nail varnish composition according to Claim 1, wherein the percentage of detachment is less than 15%.

3. The nail varnish composition according to Claim 2, wherein the percentage of detachment is less than 5%.

4. The nail varnish composition according to Claim 1, wherein the at least one film-forming polymer has a glass transition temperature ranging from -100°C to $+100^{\circ}\text{C}$.

5. The nail varnish composition according to Claim 4, wherein the at least one film-forming polymer has a glass transition temperature ranging from -50°C to $+80^{\circ}\text{C}$.

6. The nail varnish composition according to Claim 5, wherein the at least one film-forming polymer has a glass transition temperature ranging from 0°C to $+80^{\circ}\text{C}$.

7. The nail varnish composition according to Claim 6, wherein the at least one film-forming polymer has a glass transition temperature ranging from $+20^{\circ}\text{C}$ to $+80^{\circ}\text{C}$.

8. The nail varnish composition according to Claim 1, wherein the nail varnish composition is capable of forming a film having a damping power $\text{tg}\delta$ ranging from 0.5 to 1.6.

9. The nail varnish composition according to Claim 8, wherein the nail varnish composition is capable of forming a film having a damping power ranging from 0.8 to 1.4.

10. The nail varnish composition according to Claim 1, wherein the nail varnish composition is capable of forming a film having a storage modulus E' of less than 300 MPa.

11. The nail varnish composition according to Claim 10, wherein the nail varnish composition is capable of forming a film having a storage modulus E' of less than 150 MPa.

12. The nail varnish composition according to Claim 11, wherein the nail varnish composition is capable of forming a film having a storage modulus E' of less than 80 MPa.

13. The nail varnish composition according to Claim 1, wherein the at least one film-forming polymer is chosen from acrylic polymers, polyurethanes, polyureas, and polyurea-urethanes.

14. The nail varnish composition according to Claim 13, wherein the at least one film-forming polymer is chosen from acrylic polymers comprising:

- at least one first monomer chosen from ethylenically unsaturated monomers comprising at least one functional group chosen from carboxylic and sulphonic acid functional groups and an amide functional group; ethylenically unsaturated monomers comprising at least one chlorine atom; ethylenically unsaturated monomers comprising at least one hydroxyl group,
- at least one second monomer chosen from alkyl (meth)acrylates comprising at least one alkyl group chosen from C_1 - C_{18} alkyl groups, aryl (meth)acrylates comprising at least one aryl group chosen from C_6 - C_8 aryl groups, and cycloalkyl (meth)acrylates comprising at least one group chosen from C_4 - C_8 cycloalkyl groups.

15. The nail varnish composition according to Claim 14, wherein the at least one first monomer is chosen from (meth)acrylic acid, crotonic acid, acrylamidopropanesulphonic acid, N-alkyl (meth)acrylamides comprising at least one alkyl group chosen from C_1 - C_{12} alkyl groups, chlorostyrene, and vinyl alcohol.

16. The nail varnish composition according to Claim 14, wherein the at least one first monomer is chosen from (meth)acrylic acid, crotonic acid, acrylamidopropanesulphonic acid, N-tert-butyl acrylamide, chlorostyrene, and vinyl alcohol.

17. The nail varnish composition according to Claim 14, wherein the at least one second monomer is chosen from methyl (meth)acrylate, ethyl (meth)acrylate, n-propyl (meth)acrylate, n-butyl (meth)acrylate, isobutyl (meth)acrylate, cyclohexyl (meth)acrylate, and isobornyl (meth)acrylate.

18. The nail varnish composition according to Claim 14, wherein the acrylic polymers comprise at least one additional monomer chosen from vinyl esters, non-chlorinated styrene monomers, and fluorinated ethylenically unsaturated monomers.

19. The nail varnish composition according to Claim 18, wherein the at least one additional monomer is chosen from vinyl acetate, vinyl neodecanoate, vinyl pivalate, vinyl benzoate, vinyl t-butylbenzoate, styrene, alpha-methylstyrene, and trifluoroethyl methacrylate.

20. The nail varnish composition according to Claim 18, wherein the acrylic polymers comprise:

- from 0.5% to 50% by weight of the at least one first monomer, relative to the total weight of the monomers of the acrylic polymer,
- from 40% to 99% by weight of the at least one second monomer, relative to the total weight of the monomers of the acrylic polymer,
- and optionally the balance for 100% of the at least one additional monomer.

21. The nail varnish composition according to Claim 18, wherein the acrylic polymers comprise:

- from 2% to 30% by weight of the at least one first monomer, relative to the total weight of the monomers of the acrylic polymer,
- from 50% to 95% by weight of the at least one second monomer, relative to the total weight of the monomers of the acrylic polymer,

- and optionally the balance for 100% of the at least one additional monomer.

22. The nail varnish composition according to Claim 18, wherein the acrylic polymers comprise:

- from 5% to 20% by weight of the at least one first monomer, relative to the total weight of the monomers of the acrylic polymer,

- from 60% to 90% by weight of the at least one second monomer, relative to the total weight of the monomers of the acrylic polymer,

and optionally the balance for 100% of the at least one additional monomer.

23. The nail varnish composition according to Claim 14, wherein the acrylic polymers are chosen from copolymers of acrylic acid and/or tert-butyl acrylamide and alkyl (meth)acrylate comprising at least one alkyl group chosen from C₁-C₄ alkyl groups.

24. The nail varnish composition according to Claim 1, wherein the at least one film-forming polymer is chosen from copolymers of acrylic acid and alkyl (meth)acrylate comprising at least one alkyl group chosen from C₁-C₄ alkyl groups.

25. The nail varnish composition according to Claim 13, wherein the acrylic polymers are chosen from acrylic acid/methyl methacrylate/isobutyl acrylate copolymers and acrylic acid/t-butyl acrylate/isobutyl acrylate copolymers.

26. The nail varnish composition according to Claim 1, wherein the at least one film-forming polymer is chosen from polycondensates formed by polycondensation:

- of at least one diisocyanate chosen from linear and branched C₁-C₁₂ alkyl diisocyanates, C₄-C₂₀ cycloalkyl diisocyanates, and C₆-C₂₀ aryl diisocyanates;

- of at least one prepolymer comprising at least two functional groups comprising at least one labile hydrogen, having a number-average molecular mass ranging from 500 to 50 000; and

- of at least one coupler comprising two functional groups comprising at least one labile hydrogen, having a molecular mass of less than 500.

27. The nail varnish composition according to Claim 26, wherein in the at least one prepolymer, the at least two functional groups comprising at least one labile hydrogen are chosen from diols and primary and secondary diamines.

28. The nail varnish composition according to Claim 26, wherein the at least one prepolymer has a number-average molecular mass ranging from 500 to 8,000.

29. The nail varnish composition according to Claim 28, wherein the at least one prepolymer has a number-average molecular mass ranging from 1,000 to 3,000.

30. The nail varnish composition according to Claim 26, wherein in the at least one coupler, the two functional groups comprising at least one labile hydrogen are chosen from diols, primary and secondary diamines, and amino alcohols.

31. The nail varnish composition according to Claim 26, wherein the at least one coupler has a molecular mass of greater than or equal to 50 and less than 500.

32. The nail varnish composition according to Claim 31, wherein the at least one coupler has a molecular mass of greater than or equal to 75 and less than 500.

33. The nail varnish composition according to Claim 26, wherein the at least one diisocyanate is chosen from hexamethylene diisocyanate, isophorone diisocyanate, dicyclohexylmethane diisocyanate, toluene diisocyanate, diphenylmethane diisocyanate, dicyclohexylmethane diisocyanate, and tetramethylxylene diisocyanate.

34. The nail varnish composition according to Claim 26, wherein the at least one prepolymer is chosen from (poly(tetramethylene oxide))diols comprising from 10 to 80 tetramethylene oxide units; polydimethylsiloxanes comprising at least one end group chosen from (C₂-C₈)alkyleneamino(C₂-C₈)alkyl groups and C₂-C₈ ω-hydroxyalkyl groups;

and hydrogenated polybutadienes comprising at least one hydroxyl end group.

35. The nail varnish composition according to Claim 26, wherein the at least one prepolymer is non water-soluble.

36. The nail varnish composition according to Claim 26, wherein the at least one coupler is chosen from butanediol, neopentyl glycol, amino ethanol, propylene glycol, ethylene glycol, diethylene glycol, triethylene glycol, and cyclohexanedimethanol.

37. The nail varnish composition according to Claim 26, wherein the at least one prepolymer and the at least one coupler are present in the at least one film-forming polymer in an amount such that the prepolymer/coupler molar ratio ranges from 1:1 to 1:5 and the (prepolymer + coupler)/diisocyanate molar ratio ranges from 0.9:1 to 1.1:1.

38. The nail varnish composition according to Claim 37, wherein the at least one film-forming polymer is chosen from polyurethanes.

39. The nail varnish composition according to Claim 26, wherein the at least one film-forming polymer is such that the at least one prepolymer, the at least one diisocyanate, and the at least one coupler are present in the at least one film-forming polymer in the following molar proportion:

the at least one prepolymer: 1;

the at least one diisocyanate: from 2 to 6; and

the at least one coupler: from 1 to 5.

40. The nail varnish composition according to Claim 26, wherein when the (prepolymer + coupler)/diisocyanate molar ratio is less than 1, the free isocyanate groups are blocked by reaction with at least one compound comprising at least one labile hydrogen.

41. The nail varnish composition according to Claim 40, wherein the at least one compound comprising at least one labile hydrogen is ethanol.

42. The nail varnish composition according to Claim 1, wherein the at least one film-forming polymer has a number-average molecular weight of less than or equal to 300 000.

43. The nail varnish composition according to Claim 42, wherein the at least one film-forming polymer has a number-average molecular weight ranging from 10 000 to 150 000.

44. The nail varnish composition according to Claim 1, wherein the at least one film-forming polymer is present in an amount ranging from 0.1% to 60% by weight, relative to the total weight of the composition.

45. The nail varnish composition according to Claim 44, wherein the at least one film-forming polymer is present in an amount ranging from 0.1% to 40% by weight, relative to the total weight of the composition.

46. The nail varnish composition according to Claim 1, further comprising at least one additional film-forming polymer chosen from sulphonamide resins, alkyd resins, and cellulose esters.

47. The nail varnish composition according to Claim 1, further comprising at least one plasticizing agent.

48. The nail varnish composition according to Claim 1, comprising at least one organic solvent medium.

49. The nail varnish composition according to Claim 48, wherein the at least one organic solvent medium is anhydrous.

50. The nail varnish composition according to Claim 48, wherein the at least one organic solvent medium comprises at least one organic solvent chosen from ketones, alcohols, glycols, propylene glycol ethers, short-chain esters, ethers, alkanes, aromatic cyclic compounds, and aldehydes.

51. The nail varnish composition according to Claim 1, comprising at least one aqueous medium.

52. The nail varnish composition according to Claim 1, further comprising at least one cosmetic additive chosen from thickening agents, coloring matters, fillers, spreading agents, wetting agents, dispersing agents, antifoams, preservatives, UV-screening agents, active agents, surfactants, moisturizing agents, perfumes, neutralizers, stabilizers, and antioxidants.

53. A cosmetic method for making up and/or non-therapeutic care of nails, comprising applying to the nails at least one layer of a nail varnish comprising, in a cosmetically acceptable medium, at least one film-forming polymer, wherein the nail varnish composition is capable of forming a film having an adherence, measured according to the ASTM D 3359-7 standard, corresponding to a percentage of detachment of less than 35%.